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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,325	02/06/2001	Toshihisa Suzuki	P/2007-79	2906

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EXAMINER

CAO, ALLEN T

ART UNIT	PAPER NUMBER
2652	

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/777,325

Applicant(s)

SUZUKI ET AL.

Examiner

Allen T Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) 2, 4 and 6-15 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 and 19 is/are allowed.
- 6) ☒ Claim(s) 5, 16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 2 and 4-19 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. Claims 16, 2, 4-5 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) The phrase "another magnetic layer" in claim 16, line 7 is vague and indefinite because it is unclear as to what is "another magnetic layer". It is unclear as whether the "another magnetic layer" is either the upper magnetic layer or the lower magnetic layer or a different magnetic layer.

b) The phrase "... either one of another pair of magnetic tunnel junction structures" in claim 16, lines 7-8 is vague and indefinite because it lacks metes and bounds of the claimed invention. It is also conflicted with the phrase "a pair of physically separated magnetic tunnel junction structures" in claim 16, line 2. Applicant only claim a single pair of magnetic tunnel junction structures, it is conflicted that Applicant now introduces with "another pair of magnetic tunnel junction structures" as claimed in lines 7-8.

As above notes, the limitations in claim 16, lines 6-8 will not be considered in the following Office Action.

Claims 2 and 4 have been withdrawn from the consideration due to Application's election without traverse on 1/7/04 will also not be considered.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill (US. 6,567,244 B1) in view of Sato et al (US. 6,710,986 B1).

Gill discloses a pair of magnetic tunnel junction structures (figure 11 and column 5, lines 30-32) as recited in claim 16.

Gill does not disclose the structure relationship of a barrier film, lower and upper magnetic layer, and an upper electrode electrically connected to the upper magnetic layer as set forth in claim 16.

Sato et al disclose a magnetic tunnel junction structure having a barrier film 310 sandwiched between a lower magnetic layer 210 and an upper magnetic layer 110, and an upper electrode electrically connected to the upper magnetic layer (see figure 2 shows that there is an electrode electrically connected to the layer 110), and a substrate 510.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify/replace each magnetic tunnel junction of a pair of the magnetic tunnel junction structures of Gill with such combined structural of the magnetic tunnel junction structure as set forth, supra as taught by Sato et al to improve the outputs of the head in order to improve the read/write characteristics of the head.

Regarding claim 18, Sato et al also disclose a conductive layer 410 (lead wire layer) provided on the substrate 510 and under the magnetic tunnel junction as described in the above.

Regarding claim 5, Sato et al disclose that the magnetic tunnel junction is formed by etching process on the conductive layer (column 14, lines 24-25).

However, Gill as modified by Sato et al do not disclose that the magnetic junction is formed by ion beam etching on the conductive layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the magnetic tunnel junction of Gill as modified by Sato et al with an ion beam etching process on the conductive layer instead of an etching process.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify the magnetic tunnel junction of Gill as modified by Sato et al with an ion beam etching process on the conductive layer instead of an etching process as a result of routine engineering optimizing. Applicant has shown no criticality for such as any unexpected results deriving from such. Additionally, it is not found to be persuasive as a process limitation should only be accorded weight to the extent that it affects the structure of the completed magnetic tunnel junction structure since claims are directed to a "magnetic resistance device", per se. Furthermore, it should be noted that "[d]etermination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process, and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior art product was made by a different process", In re Thorpe, et al., 227 USPQ 964 (CAFC 1985). It should also be noted that a "[p]roduct-by process claim, although reciting subject matter of claim in terms of how it is made, is still product claim; it is patentability of product claimed and not recited process steps that must be established, in spite of fact that claim may recite only process limitations", In re Hirao and Sato, 190

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USPQ 685.

4. Claims 17 and 19 are allowed.

Response to Arguments

5. Applicant's arguments filed 10/4/04 have been fully considered but they are not persuasive.

In the Remarks, Applicant asserts that Gill in the combination with Sato et al is not a proper basis for the rejection because Gill as modified by Sato et al "fails to disclose the electrode electrically connected to the upper magnetic layer and electrically connected to another magnetic layer ...".

The Examiner respectfully maintains the rejection as set forth in the above rejection because of the reason as stated in the above paragraph No. 1.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen T Cao whose telephone number is (703) 305-3796. The examiner can normally be reached on Mon - Thurs (7:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen Cao
Primary Examiner

AC

December 23, 2004